CITY OF Fremont

City Council Work Session

Railroad Quiet Zone Feasibility Study

July 17, 2007

Presentation Outline

- Purpose
- Background
- Existing Conditions
- Quiet Zone Establishment Process
- Safety and Liability
- Next Steps

Purpose

- Provide an explanation of the federal rule regarding the sounding of locomotive horns at street crossings
- Introduce the process and requirements for establishing a “quiet zone” where a locomotive horn would be silenced
- Obtain City Council comments to proceed with the potential development of quiet zone projects

Background

- Hired RL Banks and Associates to prepare the study
- Study: To determine requirements and resources needed to establish quiet zones in Fremont
- To provide information to aide Council in future consideration of quiet zones
- Presenting the first half (overview and process)
- Staff will return to present recommendations at a second work session

Background

- Use of Locomotive Horns at Highway-Rail Grade Crossings, 49 CFR Parts 222 and 229
- Interim Final Rule (released December 18, 2003)
- Final Rule (effective 6/24/05, amended 8/17/06)
- The Rule preempts state and local laws governing the sounding of locomotive horns
- The Rule describes specific steps and requirements for communities to create a Quiet Zone

Existing Conditions: Rail Lines

Name	Max Speed (mph)	Freight (trains/day)	Passenger (trains/day)
Niles Subdivision (UPRR)	45	7/1	14 (CC) 8 (ACE)
Oakland Subdivision (UPRR)	40	1/7	8 (ACE)
Warm Springs Subdivision (UPRR)	10	5	--
North Milpitas Industrial Lead (SCVTA)	10	Switch yard activity only	--

Existing Conditions: Public At-Grade Crossings

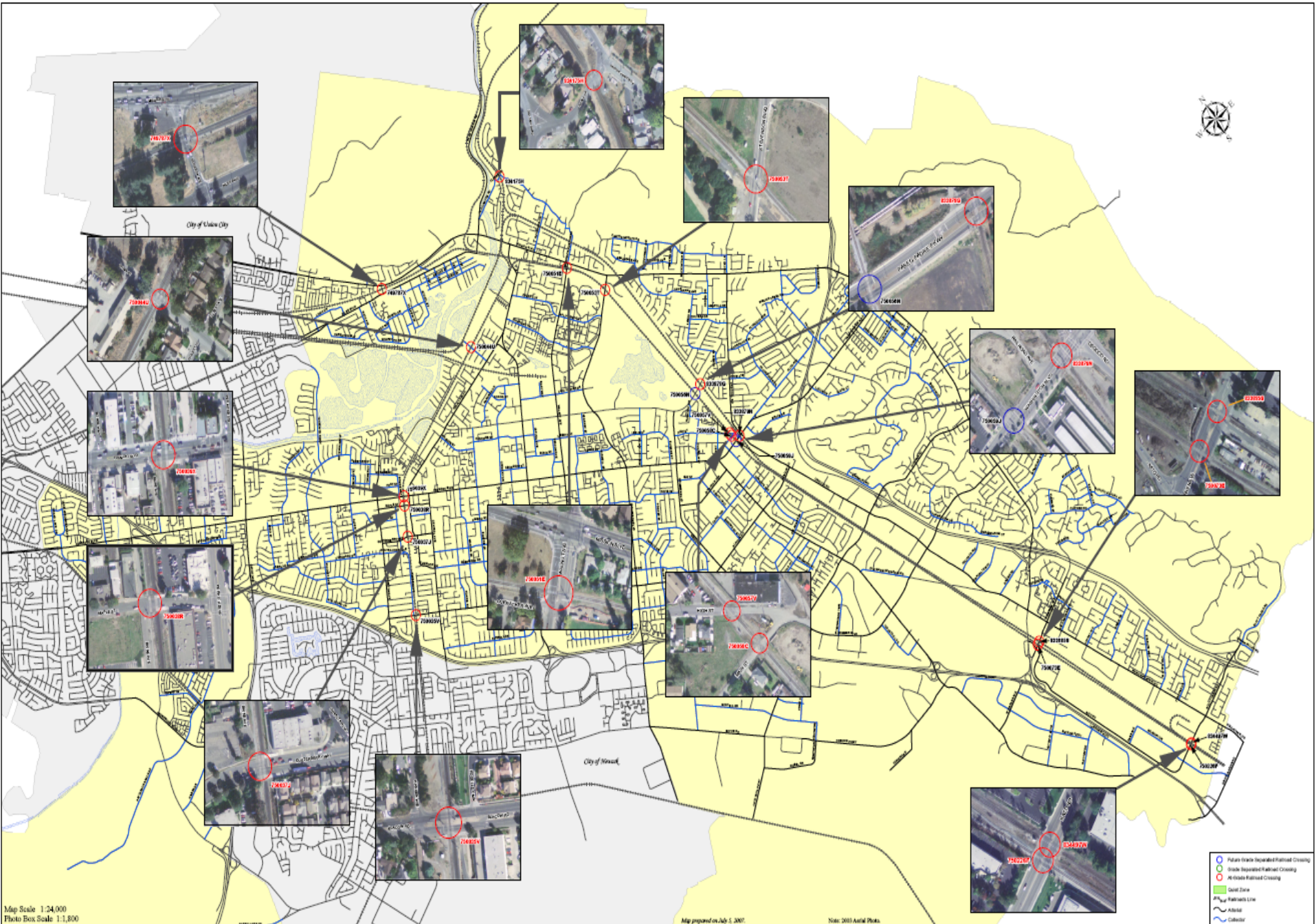
Niles Subdivision	Oakland Subdivision	Warm Springs Subdivision/North Milpitas Industrial Lead
Nursery	Clarke	Walnut
Shinn		Stevenson
Fremont		Paseo Padre
Maple		High
Dusterberry		Main
Blacow		Washington
		Warren
		Kato

Existing Conditions: Crossings

- 15 public at-grade crossings
- All public at-grade crossings have flashing lights and automatic gates
- 4 will be eliminated by Washington-Paseo Padre Grade Separation Project within 3 years
- 2 crossings (Warren Ave.) will be eliminated by the I-880/Mission Interchange improvements within 4-6 years
- One crossing is under State jurisdiction (Fremont Blvd.)

City of Fremont GIS Division
Office of Information Systems
39550 Liberty Street, P.O. Box 5006
Fremont, California 94537-5006

QUIET ZONE FEASIBILITY STUDY



Current Rule for Sounding of Horns

- Trains must sound horn 15-20 seconds before approach to an at-grade crossing, but not more than ¼-mile away
- Horns must continue to sound until locomotive occupies crossing
- Horn pattern is 2 long-1 short-1 long (repeated)
- 1994, Swift Rail Development Act, Public Law 103-440

Why is Sounding of Horn Important

- Florida Experience
  - July 1984 – Florida allowed night-time (10pm to 6am) whistle bans at crossings equipped with flashing lights, gates and special signs
  - Experienced a 195% increase in collision rate during ban hours
  - July 1991 – FRA issued Emergency Order No. 15 overriding State law
  - Collision rate returned to pre-ban level

Why is Sounding of Horn Important

- Nationwide Study 1989-1993, whistle ban crossings had an 84% average increase in collisions vs. crossings with horns sounding
- Updated analysis of the Nationwide Study found that gated whistle ban crossings had a 62% increase in collisions vs. gated crossings with horns sounding
- Horn is disruptive to quality of life, but it is a safety device to protect the public

What is a Quiet Zone

- A segment of rail line comprising one or more at-grade highway-rail crossing where trains are ordered not to routinely sound the horn
- Must be at least 1/2-mile long and include all crossings within the quiet zone limits
- All public at-grade crossings must meet certain pre-qualifying criteria
- Established based on an analysis of “risk index”

Pre-Qualifying Criteria

- FRA's grade crossing inventory must be updated (need to submit through CPUC)
- All public crossings must be equipped with:
  - Gates and flashing lights ☑
  - Constant warning time circuitry ☑
  - Power-out indicators ☑

Who May Establish a Quiet Zone

- A public authority with responsibility for safety and maintenance of roadway at crossing
  - Traffic Control Authority
  - Law Enforcement Authority
- City, County, or State

How Can a Quiet Zone be Established?

Before we move further, we need to define terms:

- Risk Index
- NSRT – Nationwide Significant Risk Threshold
- RIWH – Risk Index with Horns
- QZRI – Quiet Zone Risk Index
- SSM – Supplemental Safety Measure

Risk Index

- The predicted cost to society of the casualties that are expected to result due to a collision
- A measure of collision risk at a grade crossing
- Higher risk index = less safe
- Highway Factors: Traffic volume, highway lanes
- Rail Factors: Train volume, number of tracks, train speed
- Collision Factors: Number of accidents, injuries, and fatalities

NSRT – Nationwide Significant Risk Threshold

- Average of risk indexes of all gated crossings nationwide where train horns are sounded
- Changes annually
- Current Value: 19,047

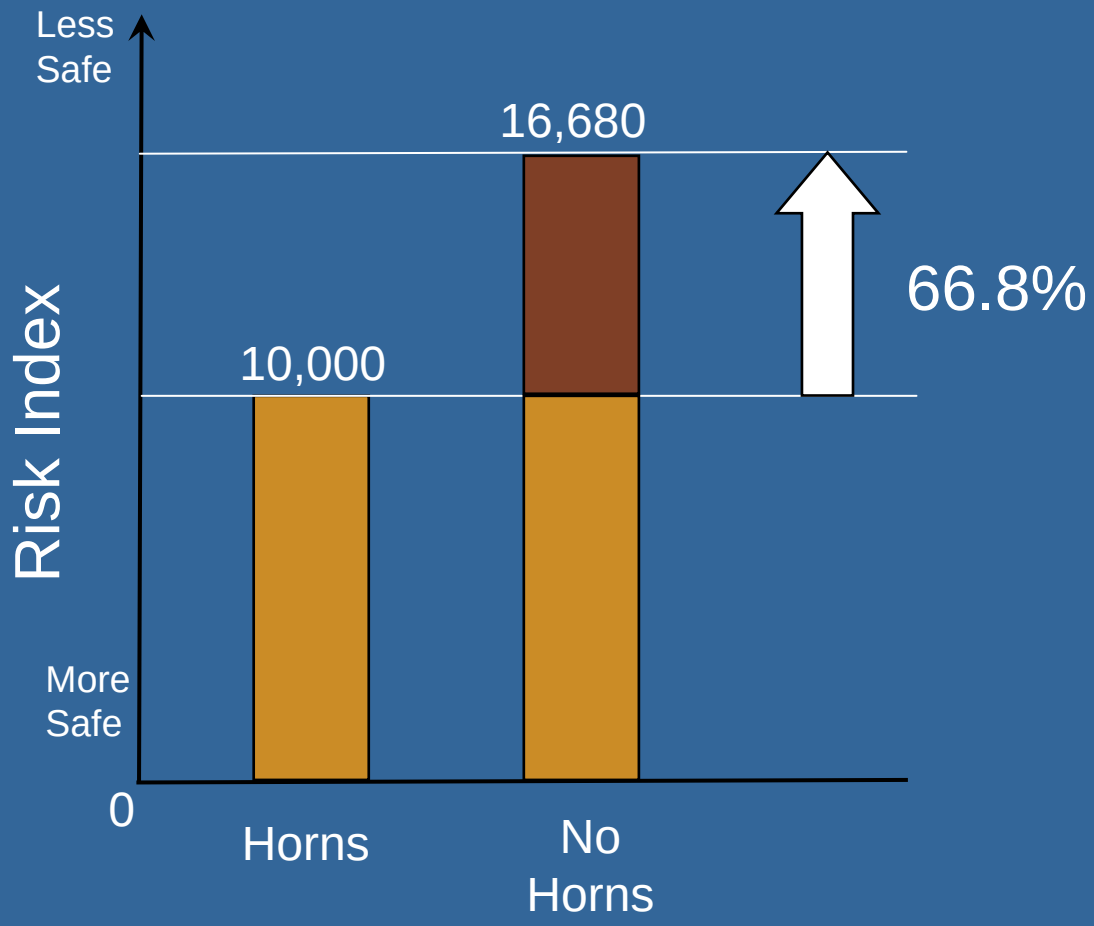
RIWH – Risk Index with Horns

- "Existing condition" risk index
- Similar to NSRT but specific to a crossing or group of crossings

QZRI – Quiet Zone Risk Index

- Risk of a crossing or group of crossings without the sounding of horns
- Increases risk by 66.8% without horn

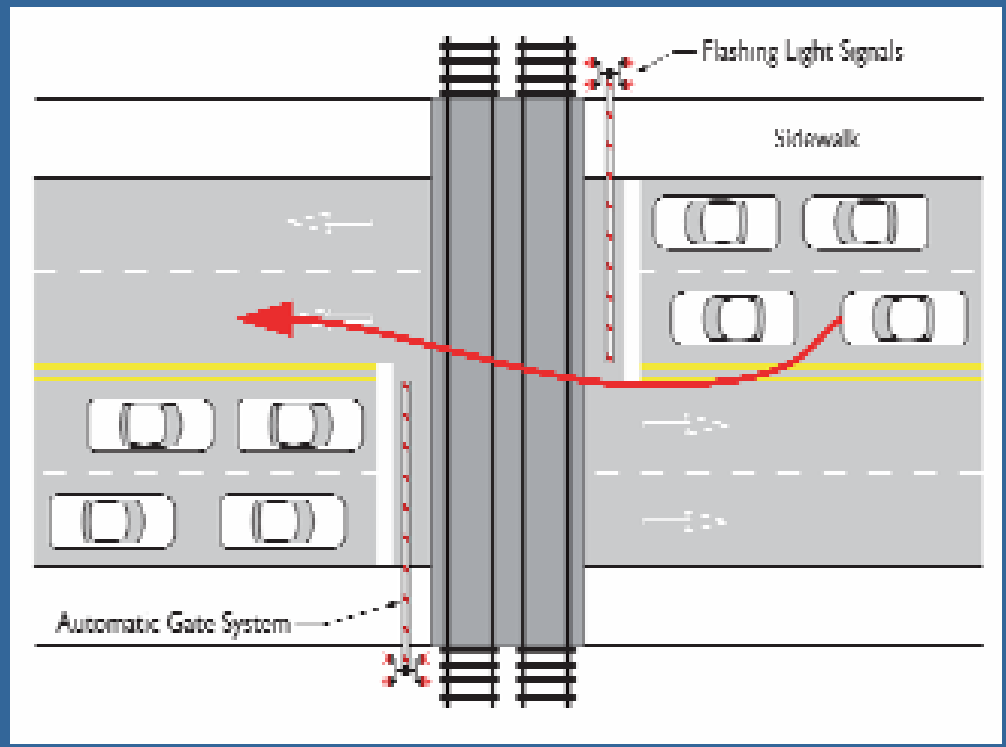
Risk Increases without Train Horn



SSM – Supplemental Safety Measure

- Pre-approved safety improvements that fully compensate for the absence of train horn
  - Four-quadrant gate system
  - Median/Channelization
  - Closure (Permanent or Temporary)
  - One-way street with gates
- Prevent vehicles from going around gates

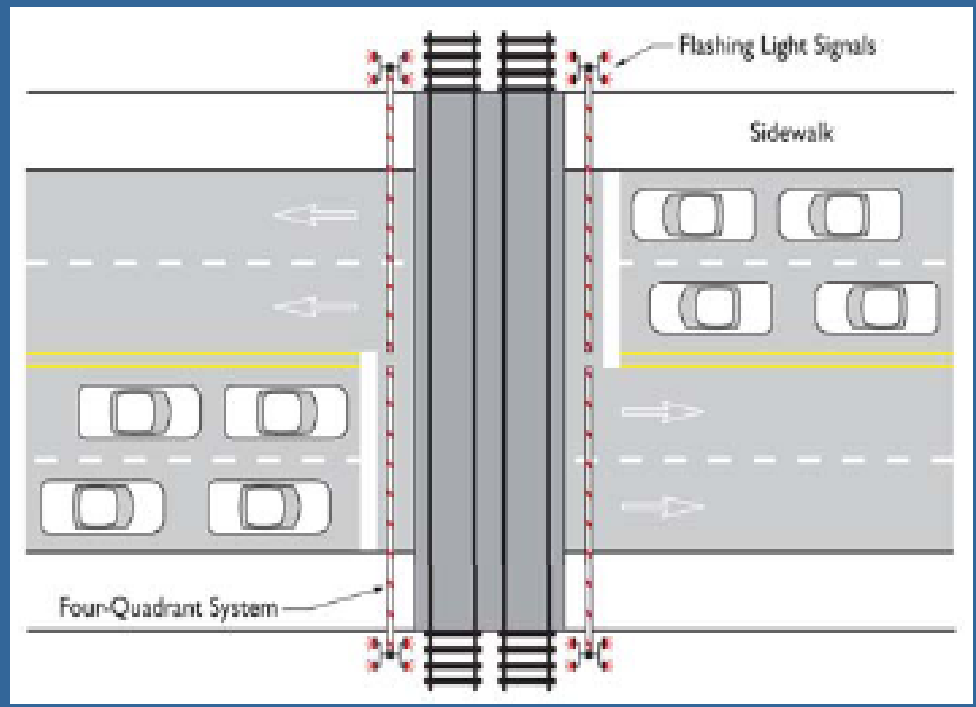
SSM – Purpose



SSM – Four Quadrant Gate System

- Fully closes the crossing (risk reduced 77-92%)
- No impact on local access
- High implementation and maintenance costs ($300k-$500k, capital cost only)
- Requires CPUC approval
- Requires UPRR coordination and approval

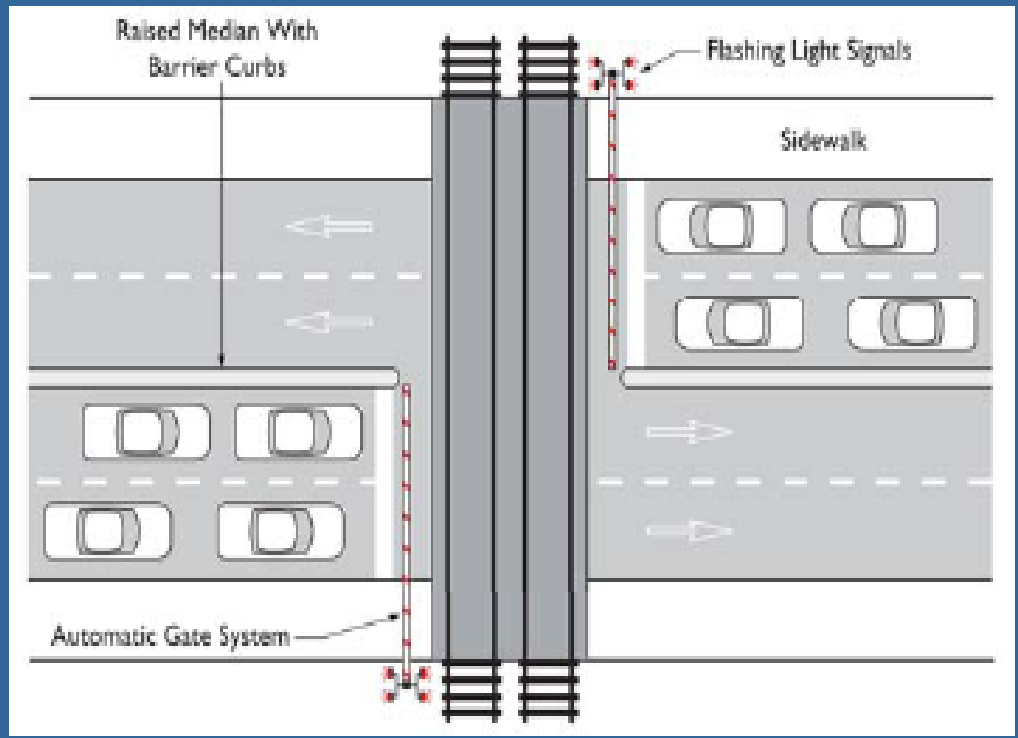
SSM – Four Quadrant Gate System



SSM – Median/Channelization

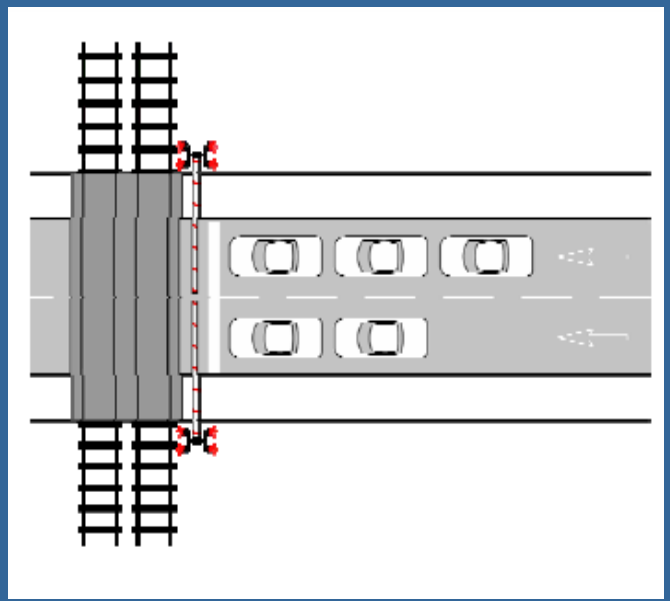
- Deters ability to drive around gate (risk reduced 75-80%)
- 100 feet long, or 60 feet if intersection present
- Low implementation and maintenance cost ($30k-$50k, capital cost only)
- Intersecting streets and driveways within 60 feet of gate arm must be closed or relocated
- May require CPUC approval
- May require UPRR coordination and approval

SSM – Median/Channelization

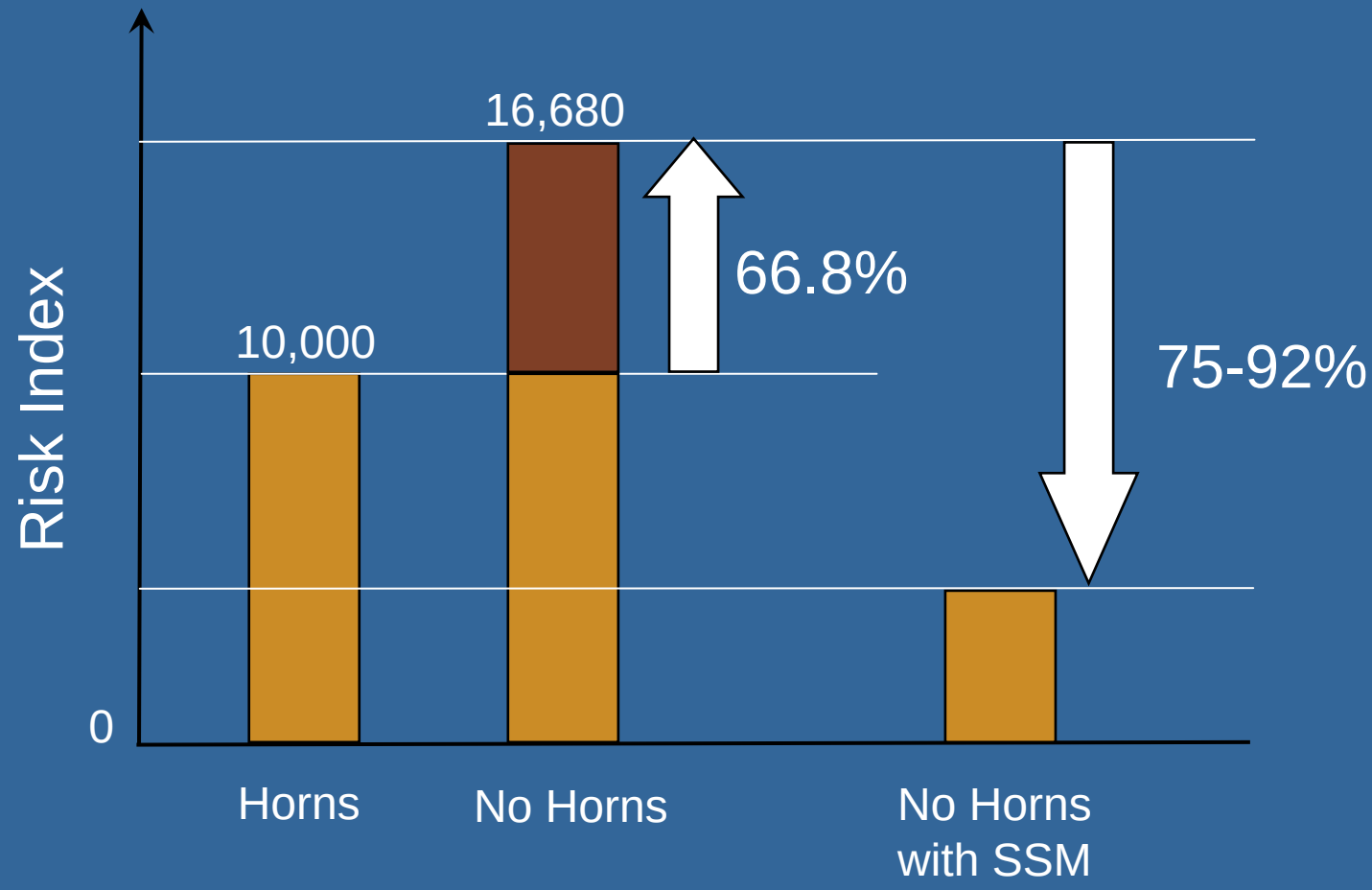


SSM – 1-Way Street w/ Gates & Street Closure

- Not viable options in urban/suburban setting
- Reduces risk by 82% (1-way) and 100% (closure)



Effects of SSMs on Risk



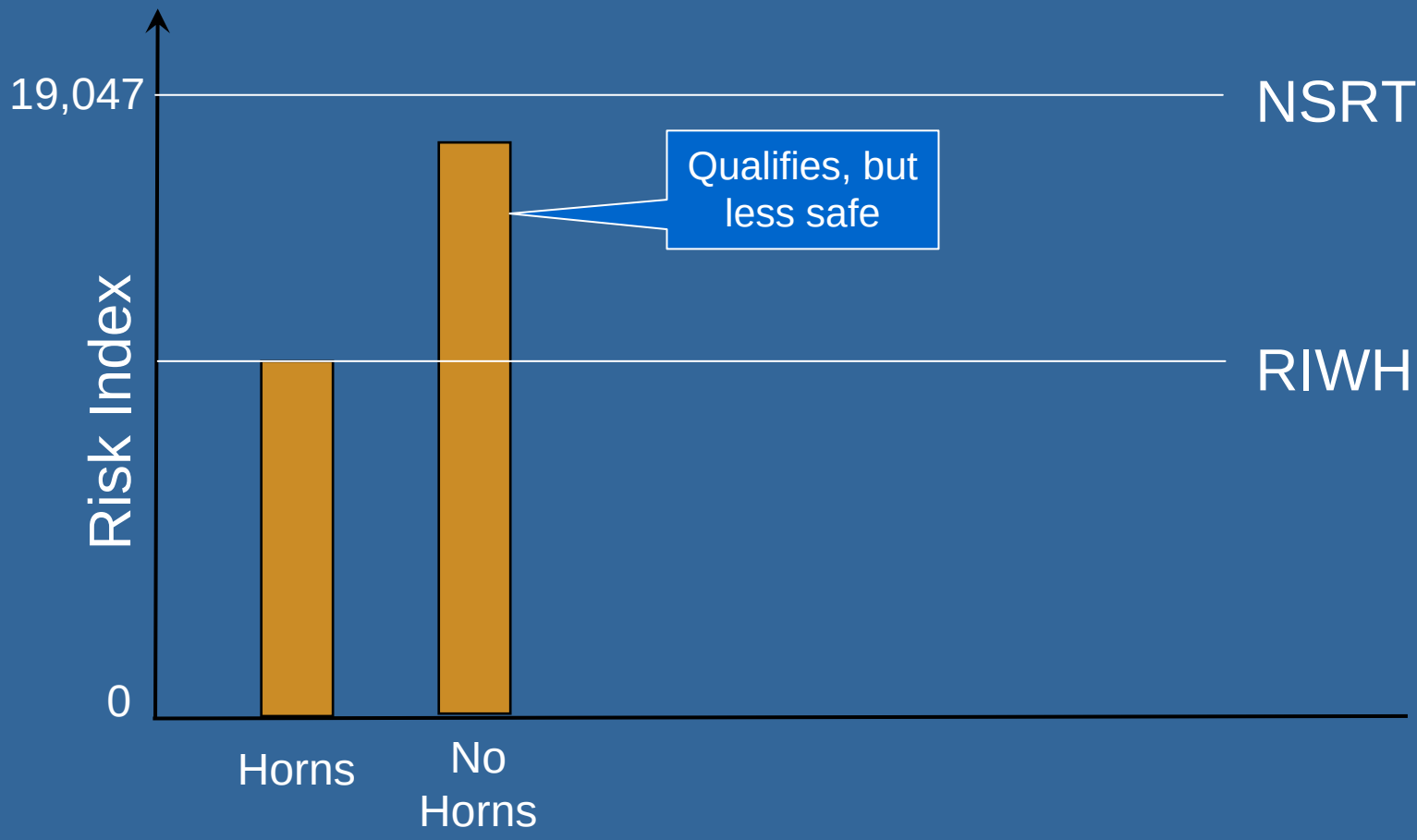
Quiet Zone Establishment Process

- Public Authority Designation
  - Risk Index Calculations
  - Use of SSMs
- Application to the FRA
  - Use of Alternative Safety Measures (ASMs)

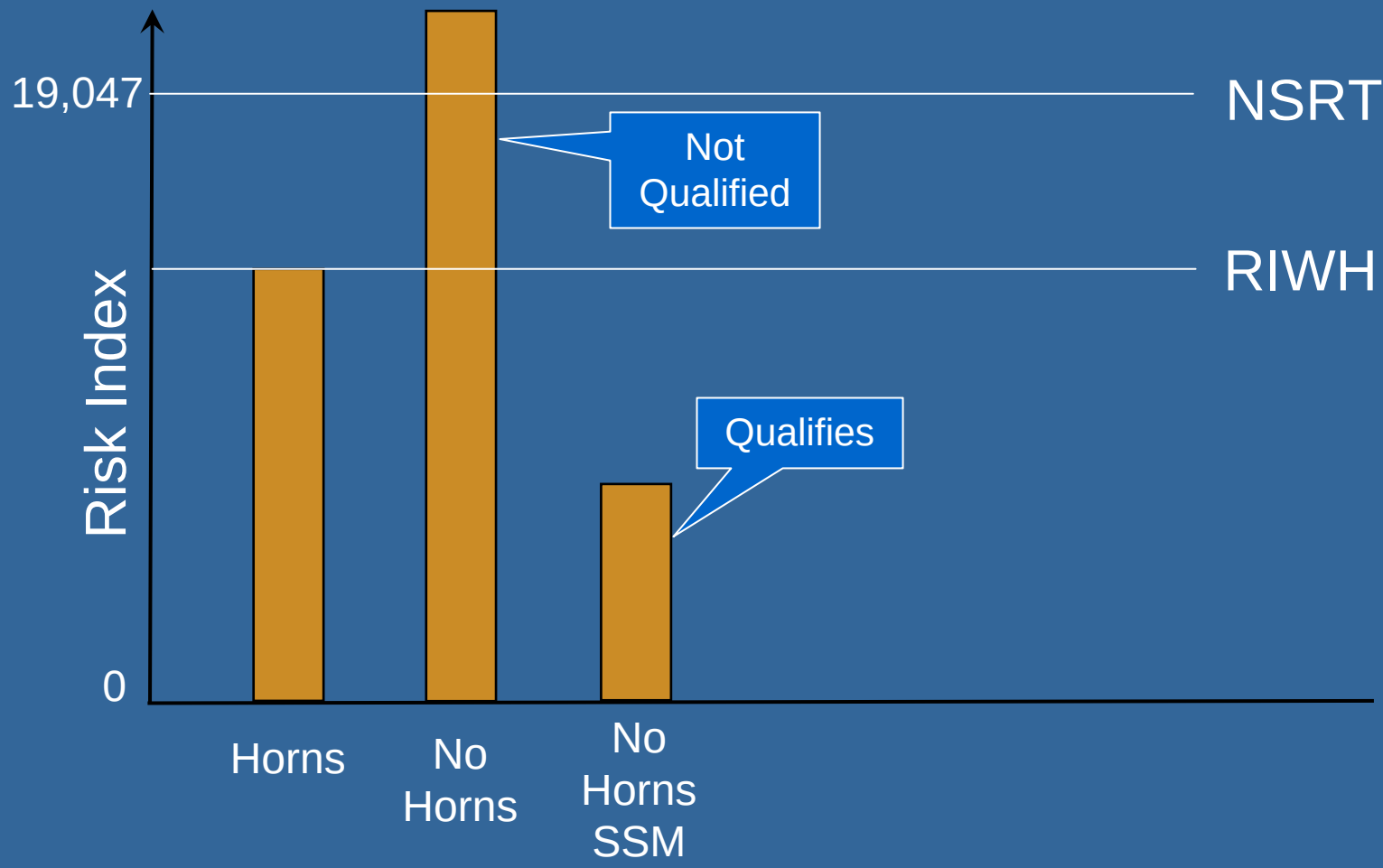
Public Authority Designation

- QZRI <= NSRT with no SSM installed
- QZRI <= NSRT with SSM installed at selected crossings
- QZRI <= RIWH with SSM installed at selected crossings
- SSM installed at all public at-grade crossings within the quiet zone (no risk analysis needed)

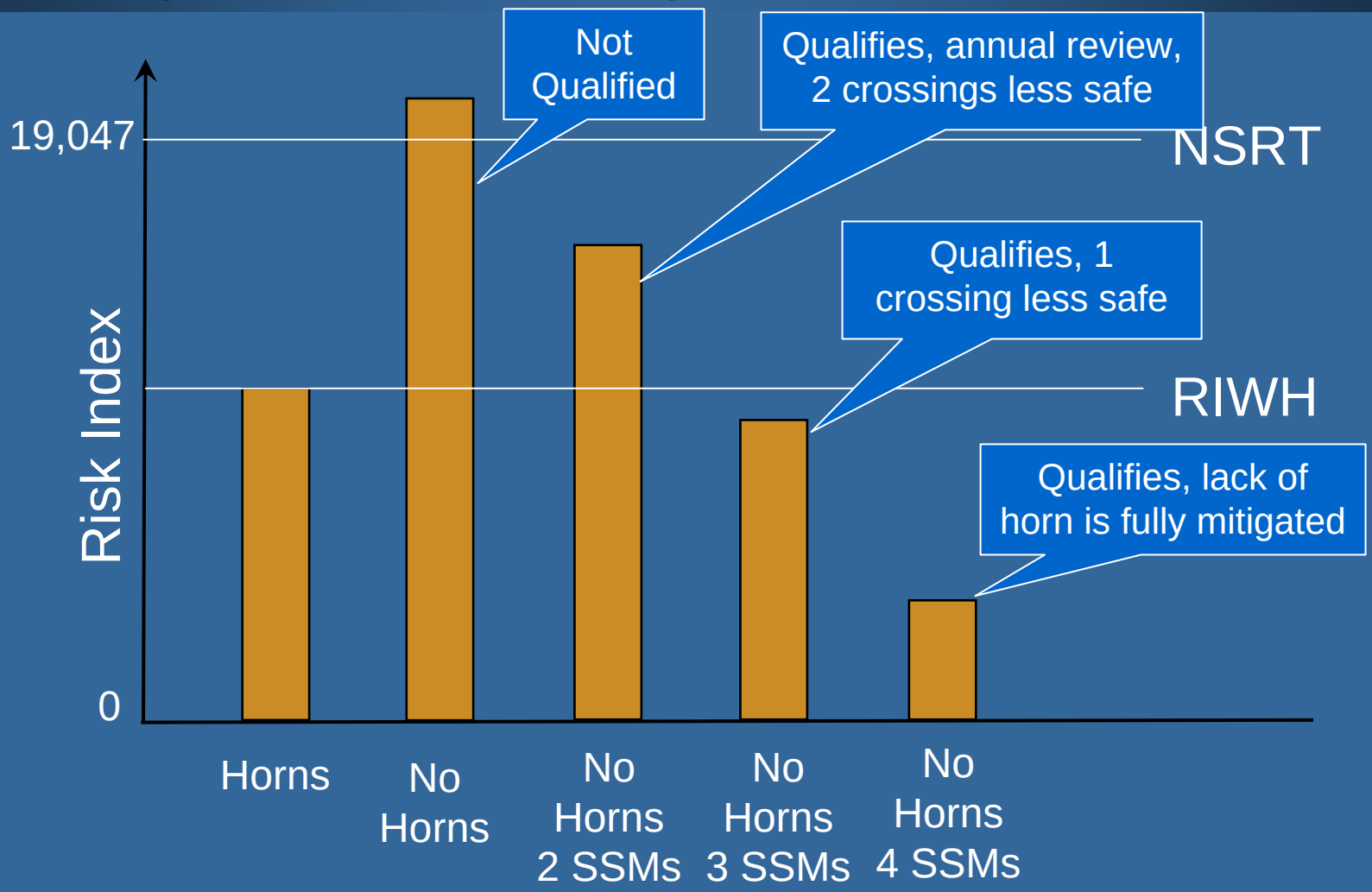
Example 1: Single Crossing Quiet Zone



Example 2: Single Crossing Quiet Zone



Example 3: 4-Crossing Quiet Zone



City Designated Quiet Zones

- No ASMs used
- No FRA approval
- SSMs at all crossings – no risk calculations
- SSMs at none/some crossings – risk analysis

City Established Quiet Zones Using NSRT

- Lowest initial cost approach
- May not require the installation of any SSMs
- Requires annual review
- No guarantee that quiet zone will remain qualified
  - NSRT may drop below QZRI
  - QZRI may increase (collision, increased road/train traffic)
- 3 years to re-qualify
- Increased risk at one or more crossing
- Increased liability

City Established QZ with No Annual Review

- SSMs at some public crossings to compensate for the lack of horn (QZRI < RIWH)
  - Overall risk is fully compensated in the zone
  - But some crossings experience higher risk
- SSMs at all public crossings – no risk calculations
  - Lack of horns fully compensated at all crossings
- Higher initial cost approach

Overall Steps to Establish Quiet Zones

- Determine limits of quiet zone
- Issue Notice of Intent (60 day comment period)
- Identify all public, private, and pedestrian crossings within limits of quiet zone
  - Private & Pedestrian crossings must have Diagnostic Review
  - Verify Public crossings meet pre-requisites
- Submit updated Grade Crossing Inventory Form
- Install SSMs at public crossings
- Install improvements at private/ped. crossings (if any)

Overall Steps to Establish Quiet Zones

- Install required signs at all public, private, and pedestrian crossings (if any)
- Issue Notice of Quiet Zone Establishment (60 day comment period)

Overall Findings

- All at-grade public crossings have the required equipment
- Many options are available with varying trade-offs
- CPUC will likely have some role in process
  - Approval process (GO 88-B)
  - Additional requirements (GO 75-B)
- Uncertainty with UPRR requirements
- The process is somewhat complex (not absolutely defined)
- Horns may still sound (discretionary use still allowed)
- Uncertainty with overall liability exposure

Council Questions and Answers

Safety and Liability

- Evidence that silencing horns increases accidents
- FRA Rule provides a structure to balance risk of removing one safety measure (horns) by adding other safety measures
- Rule leaves state liability laws in place
- Rule does not prohibit railroad tactic of shifting liability

Council Questions and Answers

Staff Recommended Approach

If quiet zones are desired:

- Install SSMs at all public crossings within the quiet zone
  - This is the safest approach (statistically)
  - Risk increase due to lack of horn at each individual crossing is fully mitigated
  - Does not result in any crossing being less safe
  - Does not require annual re-evaluation
- Consider liability impacts

Next Steps

Next Council Work Session:

- Define potential quiet zone(s)
- Recommend SSM to implement at each public crossing
- Estimate cost of establishing quiet zones
- Describe liability issues associated with recommendations

Public Comment